UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/571,668 | 03/13/2006 | Franz Auerbach | 1454.1689 | 3470 |

21171 7590 07/07/2009

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

| EXAMINER | |
|---|---|
| COMSTOCK, NATHAN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 4132 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 07/07/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/571,668 | AUERBACH ET AL. | |
| | Examiner | Art Unit | |
| | NATHAN E. COMSTOCK | 4132 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *18-36* is/are pending in the application.

4a) Of the above claim(s) *34-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Claims 34-36 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on June 4, 2009.

### *Specification*

2. The substitute specification filed 03/13/2006 has been entered.

### *Claim Objections*

3. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

4. Misnumbered claim 37 has been renumbered 36.

### *Claim Rejections - 35 USC § 112*

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 22-23 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is unclear what type of film strength is meant by the phrase "film strength." It could mean either dielectric strength, as in claim 18-19 or it

could mean mechanical strength, such as the ability to resist tearing, or, as appears to be indicated by the specification at page 10, second paragraph, it could mean film thickness.

***Claim Rejections - 35 USC § 102/103***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 18-25, 29-30 and 32-33 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over PCT Pat. App. Pub. No. WO 03/030247 to Hase et al. (of which examiner is using U.S. Pat. App. Pub. No. 2005/0032347 as a translation).

12. With respect to claims 18-19, Hase discloses an electrical device (device, paragraphs [0050] and [0078]) comprising: a substrate (copper layers 11 and 12 and ceramic layer 10, paragraph [0055] and FIG. 2A); an electrical component (semiconductor chips 2, paragraph [0057], and FIG. 2A) mounted on the substrate (FIG. 2A) so as to define a surface contour between the electrical component and the substrate (FIG. 2A); and at least one electrical insulating film (electrically insulating plastic film 3, paragraph [0063], FIG. 2B) provided on the substrate (FIG. 2B) and on the electrical component (FIG. 2B) to electrically insulate the electronic component (paragraph [0064]), the insulating film having a border section (FIG. 2C) in contact with the electrical component and the substrate (FIG. 2C) where the insulating film has a surface contour (FIG. 2C) following the surface contour formed between the electrical component and the substrate(FIG. 2C).

13. Hase does not explicitly disclose that the border section of the insulating film has a dielectric strength to withstand an electrical field strength of at least 10 kV/mm or that that the field strength is within a range of from 10 kV/mm inclusive to 200 kV/mm inclusive.

14. However, Hase does disclose that high dielectric field strengths are possible using thick insulation layers (paragraph [0039]), and films that have homogenous insulation properties

(paragraph [0041]), and that dielectric strengths in the kV region can be achieved by bonding multiple thin layers of insulation (paragraph [0066]). Moreover, high dielectric field strengths would be desirable to improve the reliability of the device against breakdown.

15. Additionally, Hase does disclose that the film is formed from the same materials as disclosed in the present application (paragraph [0022] of Hase, compared with page 5, last paragraph, to page 6, first paragraph, of present application), that the insulating film is in the same general thickness range as the film of the present application (paragraph [0066] of Hase compared to either page 10, second paragraph, or page 12, fourth paragraph, of the present application), that it is applied to the electrical component by substantially the same method (paragraph [0018] of Hase compared to page 9, last paragraph, to page 10, first paragraph, of the present application), and that the insulating film is used for the same purpose as the film of the present application (paragraph [0058 of Hase compared to page 8, last paragraph, to page 9, first paragraph, of the present application).

16. Because of the similarity between the materials, film thickness/strength, and method of application, the insulating film of Hase would either inherently have the same or similar dielectric strength as the films disclosed in the present application (i.e. have a field strength a range of from 10 kV/mm inclusive to 200 kV/mm inclusive), or alternatively, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the insulating film capable of withstanding a field strength in a range from 10 kV/mm inclusive to 200 kV/mm inclusive. One of ordinary skill in the art would have been motivated to do so because Hase teaches that high dielectric strengths are desirable (paragraph [0039] and paragraph [0066]).

17. With respect to claim 20, Hase discloses that the surface contour formed between the electrical component and the substrate has at least one geometric shape chosen from the group consisting of a corner and an edge (FIG. 2C).

18. With respect to claim 21, Hase discloses that at least the border section of the insulating film is formed of a multi-layer structure (paragraphs [0025] and [0066]).

19. With respect to claim 22, Hase discloses that at least the border section of the insulating film has an essentially constant film strength (paragraph [0041]).

20. With respect to claim 23, Hase does not explicitly disclose that wherein the border section of the insulating film has a different film strength compared to a further section of the insulating film. However, because the thickness of the film is different at certain points of the surface, i.e. from the corner of the border section to the corner of the contact plate, as opposed to from a side of the border section to the closest point on the side of the contact plate, the film will have a different film strength between those two points (FIG. 2C).

21. With respect to claim 24, Hase discloses that at least the border section of the insulating film is preformed (insulating film 3 is vacuum laminated, and therefore must have been preformed, paragraph [0063]).

22. With respect to claim 25, Hase discloses that the insulating film is formed of at least one plastic selected from the group consisting of polyacrylates, polyimides, polyethylenes, polyphenols, polyetheretherketones, polytetrafluorethylenes and epoxies (Hase discloses that the film comprises polyimide, polyethylene, polyphenol, polyether ether ketone and epoxies, paragraph [0022]).

23. With respect to claim 29, Hase discloses that the surface contour formed between the electrical component and the substrate has a height difference in a range of from 200 μm inclusive to 1000 μm inclusive (paragraph [0021]).

24. With respect to claim 30, Hase discloses that the electrical component is a semiconductor component (chip 2 is a semiconductor, paragraph [0058]).

25. With respect to claim 32, Hase discloses that at least the border section of the insulating film is formed of a multi-layer structure (paragraphs [0025] and [0066]).

26. With respect to claim 33, Hase discloses that at least the border section of the insulating film has an essentially constant film strength (paragraph [0041] and paragraph [0066]).

***Claim Rejections - 35 USC § 103***

27. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Pat. App. Pub. No. WO 03/030247 to Hase et al. (of which examiner is using U.S. Pat. App. Pub. No. 2005/0032347 as a translation).

28. With respect to claim 31, Hase discloses the electrical device as described with respect to the 35 U.S.C. §102/103 rejection of claim 30 as anticipated or in the alternative obvious in view of Hase, *supra*. Hase further discloses that the semiconductor component is a power semiconductor component (paragraph [0058]). Hase does not explicitly disclose that the power semiconductor component is selected from the group consisting of MOSFETs, IGBTs and bipolar transistors. However, MOSFETs, IGBTs and bipolar transistors are the three most common types of power semiconductors. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a MOSFET, an IGBT or a bipolar transistor as the power semiconductor of Hase. One of ordinary skill in the art at the time of the invention would

have been motivated to do so because these are the three most common types of power semiconductors.

29. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Pat. App. Pub. No. WO 03/030247 to Hase et al. (of which examiner is using U.S. Pat. App. Pub. No. 2005/0032347 as a translation) in view of U.S. Pat. No. 5,510,174 to Litman.

30. With respect to claim 26-27, Hase discloses the electrical device as described with respect to the 35 U.S.C. §102/103 rejection of claim 18 as anticipated or in the alternative obvious in view of Hase, *supra*. Hase does not explicitly disclose that the insulating film is formed of a composite material containing a plastic and at least one filler material different from the plastic or that the filler material has a mesh form. However, Litman discloses the use of fiber meshes in insulating films for the purposes of improving mechanical strength of the film (col. 3, line 42 to col. 4, line 9). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a fiber mesh of Litman in the insulating film of Hase. One of ordinary skill in the art would have been motivated to do so in order to improve the mechanical strength of the insulating film (col. 3, line 42 to col. 4, line 9).

31. With respect to claims 28, Hase does not explicitly disclose that the filler material is thermally conductive. Litman discloses the addition of thermally conductive filters to insulating films (col.1, lines 34-48 and col. 4, lines 4-8). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the thermally conductive fillers of Litman to the insulating film of Hase. One of ordinary skill in the art would have been motivated to do so in order to increase the ability of the electrical component to dissipate heat through the insulating film (col.1, lines 16-48 and col. 4, lines 4-8).

***Conclusion***

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN E. COMSTOCK whose telephone number is (571) 270-1133. The examiner can normally be reached on Monday through Thursday, 8am-5pm Eastern Standard Time.

33. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lavilla can be reached on (571) 272-1539. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

34. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N.E.C./
Nathan E. Comstock
Patent Examiner, Art Unit 4132
05 July 2009

**/Michael La Villa/**
**Michael La Villa**
**Supervisory Patent Examiner, Art Unit 4132**
**6 July 2009**